

DRAFT

ENGINEERING EVALUATION REPORT

| | |
|----------------------------|----------------------------------|
| Plant Name: | PACIFIC BELL dba AT&T |
| Application Number: | 14851 |
| Plant Number: | 13589 |

BACKGROUND

The applicant is applying for an Authority to Construct for a new emergency stand-By IC engine, following loss-of-exemption for such engines on May 17, 2000. The IC engine was installed during the interim period of May 17, 2000 through August 31, 2001.

The applicant is requesting a Permit to Operate for the following equipment:

S-1 Emergency Stand-By IC Engine; Caterpillar Model 3406, 449 BHP

CUMULATIVE EMISSION CALCULATIONS

The proposed engine has been certified by the California Air Resources Board under Executive Order U-R-1-95, as a member of the EPA/CARB family XCPXL14.6ERK. For calculating emissions from this engine, California certified emission factors were used for all criteria pollutants. The approved emission factors for this engine for all criteria pollutants except SO₂ are as follows:

| | | |
|-----------------|-------|----------|
| PM | 0.1 | g/bhp-hr |
| NO _x | 6.5 | g/bhp-hr |
| CO | 0.8 | g/bhp-hr |
| POC | 0.1 | g/bhp-hr |
| SO ₂ | 0.147 | g/bhp-hr |

The applicant requested operation at 50 hours per year, which is consistent with the California Air Resources Board Air Toxic Control Measure for Diesel Particulate Matter, 17 CFR 93115, Air Toxic Control Measure for Stationary Compression Ignition Engines (December 4, 2004) (see

Attachment 1). At a 50 hour/year testing and maintenance limitation, criteria emissions are as follows:

| | | PM10 | NOX | CO | ORG | SO2* |
|-----------------------|------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| SOURCE | BHP | G/BHP-HR | G/BHP-HR | G/BHP-HR | G/BHP-HR | G/BHP-HR |
| S-1 | 449 | 0.100 | 6.500 | 0.800 | 0.100 | 0.147 |
| TOTAL G/HR | | 45 | 2,919 | 359 | 45 | 66 |
| TOTAL LB/HR | | 0.10 | 6.43 | 0.79 | 0.10 | 0.15 |
| TOTAL LB/DAY | | 2.38 | 154.42 | 19.01 | 2.38 | 3.49 |
| TOTAL LB/50 HR | | 4.95 | 321.7 | 39.6 | 4.9 | 7.3 |
| TOTAL TPY | | 0.0025 | 0.161 | 0.020 | 0.002 | 0.004 |

*SO2 Emission Factor based on 0.05% bw sulfur fuel

TOXIC RISK MODELING

The District uses PM emissions as a proxy for toxic emission exposure to surrounding residential and industrial populations. A PM emissions level of 0.58 lbs/year automatically triggers a health risk assessment according to Regulation 2, Rule 5. At a maximum 50 hours per year permitted operation of this engine, this application exceeds a PM emission level of 0.58 lbs/year and so requires that a health risk assessment be performed.

A health risk assessment for the facility was performed using a cumulative nominal rate of 1 g/sec of diesel particulate emissions for the engine. Source S-1 emissions will exit through a 5" stack located 26 feet above ground level. The stack is vertical without a raincap.

Because no representative meteorological data was available for this site, an ISCST3 model for PM10 exposure was used to estimate maximum 1-hour average ambient PM10 concentrations. Annual average concentrations were estimated to be equal to ten percent of the predicted maximum 1-hour maximum average concentration at each receptor. Distance and directionality were used as the primary considerations to determine sites of maximum exposure. Residential risk is based on a continuous 70-year exposure to annual average pollutant concentrations. Both rural and urban terrain models were run. The site is in a mixed residential/commercial area, with the closest residential receptor located immediately adjacent to the source. There is a school, Sonoma Charter School, located approximately 921 feet away from the proposed source.

At 50 hr/year operation per engine, the highest residential risk was obtained by modeling emissions from a rural engine. This model produced a maximum annual residential GLC of 28.4 µg/m³ per g/sec, resulting in a cancer risk of approximately 0.67 in a million, and a maximum annual non-residential GLC of 22.6 µg/m³ per g/sec, resulting in a cancer risk of approximately 0.44 in a million. The maximum annual GLC at Sonoma Charter School is 15.7 µg/m³ per g/sec, resulting in a carcinogenic risk of approximately 0.07 in a million. Associated health hazard indices are less than 1.0 for all cases.

The maximum calculated carcinogenic risk is below 10 in a million and the maximum calculated chronic hazard index is less than 1.0, and so the engine as proposed is acceptable under the Regulation 2, Rule 5.

BACT/TBACT REVIEW

Under Regulation 2, Rule 2, any new source which results in an increase of criteria pollutants must be evaluated for adherence to BACT control technologies. For compression ignition IC engines, this means the engine must be fired on “California Diesel Fuel” (fuel oil with less than 0.05% by weight sulfur content, and less than 20% by volume aromatic hydrocarbons). TBACT requires that the engines emit no more than 0.15 g/bhp-hr of PM10 and BACT requires that the engines emit no more than 6.9 g/bhp-hr of NOx. Since this engine has PM emissions of 0.1 g/bhp-hr and NOx emissions of 6.5 g/bhp-hr, the IC engine proposed for this facility meets TBACT and BACT requirements.

COMPLIANCE DETERMINATION

This engine is covered under ministerial exemption, Chapter 2.3 of the BAAQMD Permit Handbook. CEQA is not triggered for emergency stand-by engines under this provision.

The engine is governed by and complies with the **California Air Resources Board’s Air Toxic Control Measure for Stationary Compression Ignition Engines, CCR Title 17, Section 93115**. The explicit annual equipment usage limitation of 50 hours per year except for operation under emergency conditions (Reg 9-8-330) will be included as part of the permit conditions.

The engine is also governed by and complies with the provisions of **Regulation 2, Rule 5, “New Source Review for Toxic Air Contaminants.”**

The engine is exempt from emission limitations of District **Regulation 9, Rule 8-301 and 8-302**, “Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines,” since it meets the provisions of **Regulation 9, Rule 8-111.1**, (operation of less than 200 hours per year and firing rate at or below 1000 BHP).

Visible emissions will be required to meet Ringelmann 2.0 limitation per **Regulation 6-303.1**.

Sulfur emissions will be controlled by the requirement that any fuel used in the engine meet California Clean Air fuel content of 0.05% bw sulfur, per Regulation **9-1**.

This is a new source, and no sources are proposed to be closed in connection with this application. The facility will not emit more than 1 TPY of PM10 or SO2 or 15 TPY of POC or nitrogen oxides. Therefore, the facility is not subject to emission offset requirements under Regulation 2-2-302 or 2-2-303.

CONDITIONS

Condition #23273, setting out the operating conditions and recordkeeping requirements for operations at Source S-1 shall be made part of the source's authority to construct/permit to operate.

RECOMMENDATION

I recommend that an Authority to Construct be issued for the following source:

S-1 Emergency Stand-By IC Engine; Caterpillar Model 3406, 449 BHP

subject to Condition #23273.

By Catherine S. Fortney Date 10/23/06

COND# 23273 -----

1. Emergency stand-by IC engine S-1 shall be fueled exclusively by diesel fuel having a sulfur content no greater than 0.05% by weight. [Reg 9-1-304]
2. Emergency stand-by IC engine S-1 shall only be operated to mitigate emergency conditions or for reliability-related operations. Operations for reliability-related activities shall be limited to 50 hours per engine in any consecutive 12-month period. Operation while mitigating emergency conditions is unlimited. [CARB ATCM for Stationary CI engines]
3. Emergency conditions are defined as any of the following:
 - a. Loss of regular natural gas supply
 - b. Failure of regular power supply
 - c. Flood mitigation
 - d. Sewage overflow mitigation
 - e. Fire
 - f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor [Reg 9-8-231]
4. Reliability-related activities are defined as any of the following:
 - a. Operation of an emergency stand-by engine to test its ability to perform for an emergency use
 - b. Operation of an emergency stand-by engine during maintenance of a primary motor [Reg 9-8-232]
5. The emergency stand-by engine shall be equipped with a non-resettable totalizing meter that measures and records the hours of operation for the engine. [Reg 9-8-530]
6. The following monthly records shall be maintained in a District-approved log for at least 2 years and shall be made available to the District upon request:
 - a. Total hours of operation for each engine
 - b. Total hours of operation under emergency conditions for each engine, and a description of the nature of the emergency condition
 - c. Total fuel usage for each engine [Reg 9-8-530]

ATTACHMENT 1

FINAL REGULATION ORDER

AIRBORNE TOXIC CONTROL MEASURE FOR STATIONARY COMPRESSION IGNITION ENGINES

(DECEMBER 4, 2004)

| TABLE 1: SUMMARY OF THE EMISSION STANDARDS AND OPERATING REQUIREMENTS FOR NEW STATIONARY EMERGENCY STANDBY DIESEL-FUELED CI ENGINES > 50 BHP (SEE SUBSECTION (e)(2)(A)3.) | | | | |
|---|---|--|------------------------------------|--|
| DIESEL PM | | | | OTHER POLLUTANTS |
| DIESEL PM STANDARDS (g/bhp-hr) | MAXIMUM ALLOWABLE ANNUAL HOURS OF OPERATION FOR ENGINES MEETING DIESEL PM STANDARDS | | | HC, NOx, NMHC+NOx, AND CO STANDARDS (g/bhp-hr) |
| | Emergency Use | Non-Emergency Use | | |
| | | Emission Testing to show compliance ² | Maintenance & Testing (hours/year) | |
| ≤0.15 ¹ | Not Limited by ATCM ³ | Not Limited by ATCM ³ | 50 | Off-Road CI Engine Certification Standards for an off-road engine of the same model year and horsepower rating, or Tier 1 standards for an off-road engine of the same maximum rated power. ⁴ |

1. Or off-road certification standard (title 13 CCR section 2423) for an off-road engine with the same maximum rated power, whichever is more stringent
2. Emission testing limited to testing to show compliance with subsections (e)(2)(A)3.
3. May be subject to emission or operational restrictions as defined in current applicable district rules, regulations, or policies.
4. The option to comply with the Tier 1 standards is available only if no off-road engine certification standards have been established for an off-road engine of the same model year and maximum rated power as the new stationary emergency standby diesel-fueled CI engine.